



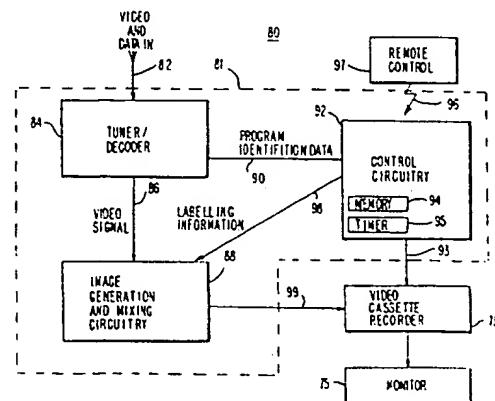
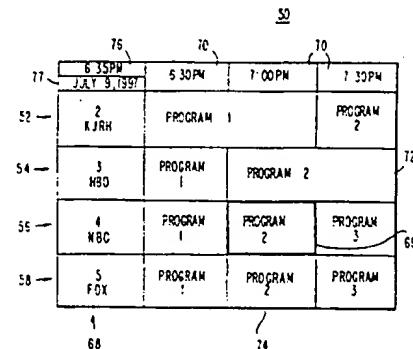
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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## (54) Title: SYSTEM FOR LABELLING VIDEOCASSETTES WITH PROGRAM INFORMATION

## (57) Abstract

A system for labelling videocassettes with program information is provided. The labelling system displays a program guide grid on a user's television equipment. The grid contains rows of television program listings for various channels. Columns in the grid are associated with the scheduled start times of the listed programs. The user can record a given one of the television programs by positioning a highlight region on one of the programs and pressing an appropriate key on a remote control. When the system receives a corresponding command from the remote control, the system records television program information in the form of a label simultaneously with the recorded television program. The program label is recorded momentarily at the beginning of each taped program. The label may include information such as the program broadcast time, channel, date, title, etc.



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SYSTEM FOR LABELLING VIDEOCASSETTES  
WITH PROGRAM INFORMATION

Background of the Invention

This invention relates to video systems, and  
5 more particularly, to television program recording  
systems in which a momentary program label is recorded  
in addition to a desired television program.

Cable, satellite, and broadcast television  
systems provide viewers with a large number of  
10 television channels. Users have traditionally  
consulted printed television program schedules to  
determine the programs being broadcast at a particular  
time. More recently, interactive electronic television  
program guides have been developed that allow  
15 television program information to be displayed on a  
user's television.

Interactive program guides allow the user to  
navigate through the television program listings using  
a remote control. In a typical program guide display,  
20 television listings are organized in a grid. Each row  
in the grid contains television program listings for a  
different channel. The columns in the grid correspond  
to a series of scheduled broadcast times. The user can  
scroll up or down to view program listings for

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different channels or may pan left or right to view information about programs being broadcast at different times.

Some interactive program guides allow users 5 to control the operation of a videocassette recorder using program information from the guide. Such interactive program guide systems attempt to ease the difficulties associated with videocassette recorder programming.

10 However, users still find it difficult to keep track of the various programs they record. Some videocassette recorder systems have the ability to store a summary of the programs contained on a given videocassette tape on the tape. These systems can 15 display such on-tape program summaries in tabular formats on the user's television screen. However, the program summary information for the tape is typically located at the beginning of each tape, which requires the user to rewind the entire tape to access the 20 information. In addition, a substantial amount of user interaction is required to record, view, and turn on and off the program summary information.

It is therefore an object of the present invention to provide an improved technique for 25 labelling videocassette tapes with television program information.

#### Summary of the Invention

This and other objects of the invention are accomplished in accordance with the principles of the 30 present invention by providing a videocassette tape labelling system in which television program

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information is recorded momentarily at the beginning of each taped program. The television program information is recorded on the tape simultaneously with the recorded program. This allows users to readily search 5 a recorded tape to determine the contents of the tape. It also allows a user to view the program information recorded on the tape on any conventional videocassette recorder.

The program information for the program 10 labels may be provided using a data source in a satellite uplink facility. The information may be transmitted by the satellite uplink facility to a television distribution facility such as a cable system headend. The television distribution facility may then 15 distribute the information and television programming signals to user television equipment. One suitable scheme for distributing the program labelling information involves transmitting television programming on cable or satellite television channels 20 and distributing the program information in the vertical blanking interval of one of the channels or on a sideband.

User equipment for receiving and processing the television program labelling information may 25 include a set-top box and a videocassette recorder. The set-top box also receives the television programming distributed by the television distribution facility. The set-top box may process television program listings to generate an interactive television 30 program guide grid on the user's display screen if desired. The user can interact with the television program guide by entering commands via a user input

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interface. An illustrative user input interface is an infrared remote control with cursor keys, a "guide" button and a "record" button.

When the user presses "guide," a grid is 5 displayed that contains television program listings. The user can position a highlight region on a desired entry using the cursor keys. Once the user has highlighted a desired program listing, the user may depress the record button to direct the set-top box to 10 initiate recording of the program at the proper time. Recording a program in this way causes the set-top box to send a record command over a control line to the videocassette recorder. In addition, television 15 program labelling information such as the title of the current program and the current date, time, and channel is generated by the set-top and provided to the videocassette recorder as part of the video output signal from the set-top box. The labelling information for each recorded program is provided momentarily at 20 the beginning of each program so that the labelling information does not interfere with normal viewing of the recorded program when it is played back. This approach is compatible with standard videocassette recorders.

25 In another aspect of the invention, the generation and recording of program labels is accomplished directly in a videocassette recorder.

Further features of the invention, its nature and various advantages will be more apparent from the 30 accompanying drawings and the following detailed description of the preferred embodiments.

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Brief Description of the Drawings

FIG. 1 is a schematic block diagram of an illustrative system in accordance with the present invention.

5 FIG. 2 is a schematic block diagram of illustrative user television equipment in accordance with the present invention.

10 FIG. 3 is a generalized schematic block diagram of portions of the illustrative television equipment of FIG. 2.

FIGS. 4 and 5 are illustrative program guide display screens in accordance with the present invention.

15 FIG. 6 is a schematic block diagram of illustrative user television equipment in accordance with the present invention in which details of the labelling circuitry are shown.

20 FIG. 7 is an illustrative display screen during the momentary labelling of a selected television program in accordance with the present invention.

FIG. 8 is a flow chart of steps involved in the operation of the present invention.

Detailed Description of the Preferred Embodiments

25 An illustrative system 10 in accordance with the present invention is shown in FIG. 1. Main facility 12 provides data from data source 14 to television distribution facility 16 via communications link 18. Link 18 may be a satellite link, a telephone network link, a cable or fiber optic link, a microwave link, a combination such links, or any other suitable

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communications path. If it is desired to transmit video signals over link 18 in addition to data signals, a relatively high bandwidth link such as a satellite link may generally be preferable to a relatively low 5 bandwidth link such as a telephone line. Television distribution facility 16 may be a cable system headend, a broadcast distribution facility, or a satellite television distribution facility.

The data transmitted by main facility 12 to 10 television distribution facility 16 includes television program listings data (e.g., program times, channels, titles, and descriptions).

Television distribution facility 16 distributes the television program listings data to 15 multiple users via communications paths 20. Each user has user television equipment 22 for displaying the television program listings information.

Communications paths 20 preferably have sufficient bandwidth to allow television distribution facility 16 20 to distribute television programming to user television equipment. If desired, television programming may be provided over separate communications paths (not shown).

An illustrative arrangement for user 25 television equipment 22 is shown in FIG. 2. Television equipment 24 of FIG. 2 receives video and data from television distribution facility 16 (FIG. 1) at input 26. During normal television viewing, the user tunes 30 set-top box 28 to a desired television channel. The signal for that television channel is then provided at video output 30 either as a radio-frequency (RF) signal on a predefined channel (e.g., channel 3 or 4) or as a

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demodulated video signal. The video signal at output 30 is received by videocassette recorder 32, so that the user may record programs. Program recording and other features may be controlled by set-top box 28 5 using control path 34. A typical control path 34 involves the use of an infrared transmitter coupled to the infrared receiver in videocassette recorder 32 that normally accepts commands from a remote control such as remote control 40. Remote control 40 may be used to 10 control set-top box 28, videocassette recorder 32, and television 36.

Television 36 receives radio-frequency or demodulated video signals from videocassette recorder 32 via communications path 38. The video signals on 15 communications path 38 may either be generated by videocassette recorder 32 when playing back a prerecorded videocassette or may be passed through from set-top box 28. During normal television viewing, the video signals provided to television 36 correspond to 20 the desired channel to which the user has tuned with set-top box 28. When the user wishes to view interactive television program guide information, the user may press a "guide" button on remote control 40. When set-top box 28 receives commands from remote 25 control 40 that inform set-top box 28 that the guide button has been pressed, processing circuitry within set-top box 28 supplies a grid of program guide information that is displayed on television 36.

A more generalized embodiment of the user 30 television equipment of 24 FIG. 2 is shown in FIG. 3. As shown in FIG. 3, video and data signals from television distribution facility 16 (FIG. 1) are

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received by control circuitry 42 of user television equipment 44. Video signals are typically provided on multiple television channels. Data may be provided by transmission on a television channel sideband in the 5 vertical blanking interval of a television channel, or by any other suitable data transmission technique.

The user controls the operation of user television equipment 44 with user input interface 46. User input interface 46 may be a pointing device, 10 wireless remote control, keyboard, touch pad, voice recognition system, or any other suitable user input device. To watch television, the user instructs control circuitry 42 to display a desired television channel on monitor 48. To view program guide 15 information, the user instructs control circuitry 42 to display a program guide grid on monitor 48.

The functions of control circuitry 42 may be provided using the set-top box arrangement of FIG. 2. Alternatively, these functions may be integrated into a 20 television or videocassette recorder arrangement. If desired, a combination of such hardware arrangements may be used.

When a user indicates a desire to view television program guide information (e.g., by entering 25 a command with user input interface 46), control circuitry 42 generates a video image of a program guide grid. The information for the program grid may be contained in the data provided to control circuitry 42 from data source 14 (FIG. 1) in main facility 12 (FIG. 30 1). This data typically contains several weeks worth of programming information for the program guide. An illustrative program grid 50 is shown in FIG. 4.

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Program grid 50 has program listings rows 52, 54, 56, and 58. Program listings row 52 contains program listings for programs 1 and 2 on channel 2 (KJRH) during the time slots 6:30 PM, 7:00 PM, and 7:30 PM.

5 Program listings row 54 contains program listings for programs 1 and 2 on channel 3 (HBO), etc.

Program grid 50 preferably has movable cell highlight region 66, which highlights the current grid cell. The range of movement of highlight region 66 is 10 typically bounded by column 62 on the left, by program listings time cells 70 on the top, by screen boundary 72 on the right, and by lower screen boundary 74 on the bottom. Time cell 76 may be used to display the current time and date cell 77 may be used to display 15 the current date.

The user may position highlight region 66 by entering appropriate commands with user input interface 46. For example, if user input interface 46 is a remote control such as remote control 40 of FIG. 2, the 20 user can position highlight region 66 using cursors. As shown in FIG. 5, if the user repeatedly moves highlight region 66 until it reaches lower screen boundary 74, further attempts at downward movement cause the program listings to scroll in the vertical 25 direction. In the illustrative example of FIG. 5, program listings rows 54, 56, and 58 have been moved up one position in the grid. A new program listings row 55 is displayed at the bottom of grid 50. Vertical movement of highlight region 66 in the upward direction 30 may be used to scroll the program listings in the opposite direction.

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Similarly, when highlight region 66 is panned in the horizontal direction (i.e., moved to the right or left), the listings move accordingly (i.e., to the left or right respectively). Various other techniques 5 may also be used to navigate through the program listings.

Once a user positions highlight region 66 on a particular program listing, the user may elect to record that program by entering a suitable command with 10 user input interface 46. If user input interface 46 is a remote control such as remote control 40 of FIG. 2, the user may press a "record" button on remote control 40 to initiate the recording process for the highlighted program.

15 Selection of a program for recording also initiates the videocassette tape labelling process. An illustrative embodiment of user television equipment based on a set-top box that is suitable for implementing the videocassette tape labelling features 20 of the invention is shown in FIG. 6. These features may also be implemented using hardware that is integrated into a videocassette recorder. If desired, a combination of such hardware arrangements may be used.

25 User television equipment 80 of FIG. 6 includes set-top box 81, videocassette recorder 78, television monitor 75, and remote control 97.

Video for television programs and associated program identification (i.e., program listings) data is 30 received from television distributing facility 16 (FIG. 1) at input line 82. Tuner/decoder circuitry 84 provides a demodulated video signal for the television

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channel to which the viewer is tuned to image generation and mixing circuitry 88 via line 86. Tuner/decoder circuitry 84 also separates the program identification data from the video signals received on 5 input line 82 and provides the program identification data to control circuitry 92 via line 90. The program identification data provided by tuner/decoder 84 may include scheduled broadcast dates, times, channels, and program titles. Control circuitry 92 contains memory 10 94 to store the program identification data.

Set-top box 81 preferably uses the stored program identification data to provide an interactive television program guide. A user may select a program from the interactive program guide to record by 15 pressing a "record" button on remote control 97 after highlighting a desired program in the guide. Pressing "record" causes remote control 97 to send control signals 96 to control circuitry 92 that cause control circuitry 92 to tune tuner/decoder 84 to the 20 appropriate channel for the selected program at the proper time for recording. In addition, control signals 96 cause control circuitry 92 to send recording control signals to videocassette recorder 78 via line 93 to direct videocassette recorder 78 to initiate recording 25 at the proper recording time. At the time that recording begins, control circuitry 92 generates labelling information for the program being recorded. This labelling information is provided to image generating and mixing circuitry 88 via line 98.

30 Within image generation and mixing circuitry 88, the labelling information from control circuitry 92 is converted to text and/or graphics using image

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generation and character generation circuitry. The labelling information is then superimposed onto the video signal of the program being recorded that is supplied by tuner/decoder circuitry 84. A combined 5 video signal made up of the video signal for the recorded program and its associated label (e.g., its channel, title, broadcast time, date, etc.) is provided to videocassette recorder 78 for recording via line 99. The program label is preferably provided only 10 momentarily (usually for 2-20 seconds) at the start of the program. The time for which the program labelling information is displayed may be controlled by a timer such as timer 95 in control circuitry 92, which may be implemented in hardware, software, or a combination of 15 hardware and software.

One way in which control circuitry 92 can control the length of time for which the program labelling information is superimposed on top of the television program provided to videocassette recorder 20 78 is for control circuitry 92 to provide the program labelling information on line 98 for only the desired length of time. When control circuitry 92 removes the program labelling information from line 98, image generation and mixing circuitry 88 ceases to overlay 25 the label on top of the program being recorded.

Another way in which control circuitry 92 can control the length of time for which the program labelling information is superimposed on top of the television program being provided is to provide suitable control 30 signals to image generation and mixing circuitry 88 that direct image generation and mixing circuitry 88 to handle the timing associated with overlaying the

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labelling information on the video signal for the selected television program.

Regardless of which particular technique is used to control the momentary overlay of the label on 5 the program being recorded, the momentary labels allow a user to readily identify recorded programs, but do not become an unwanted visual distraction on the user's display. Labelling is initiated each time a separate event is recorded, so that labels are interspersed 10 throughout the videocassette tape on which the combined video and labelling signal is recorded. As a result, a user need not rewind to the beginning of a videocassette tape to view the labelling information. Moreover, because the labelling information is provided 15 as part of the combined video signal on line 99, program labels are recorded on videocassette tapes just like regular video signals. This allows the recorded labels to be viewed on any standard videocassette recorder during playback. The user is therefore not 20 restricted to using the equipment with which the labels were originally recorded.

FIG. 7 shows a television monitor display screen 110 on which an illustrative program label is displayed. The label may include identifiers such as 25 character strings forming the words "TIME:" 112, "DATE:" 114, "CHANNEL:" 116, and "TITLE:" 118. The time 122, date 124, channel 126, and title 128 of the recorded program 120 (i.e., the labelling information received by image generation and mixing circuitry 88 30 from control circuitry 92) are displayed adjacent to their corresponding identifiers. This labelling information is typically displayed at the beginning of

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each recorded program for 2-20 seconds. This length of display time allows the user to extract the useful label information while not interfering with the viewing of the remainder of the programs.

5        Although the labelling information shown in the illustrative example of FIG. 7 includes time, date, channel, and title information, various other types of information may be extracted from the program identification data stored in memory 94 if desired. In 10 addition, it is not necessary to display each of the time, date, channel and title components. For example, only the title might be displayed. If desired, the functions of tuner/decoder 84, control circuitry 92, and image generation and mixing circuitry 88 of FIG. 6 15 may be incorporated into a videocassette recorder.

Steps involved in creating a program label are set forth in FIG. 8. At step 132, program identification data (e.g., broadcast times, channels, dates, titles, etc.) are received and decoded by 20 tuner/decoder 84 (FIG. 6) and provided to control circuitry 92 (FIG. 6). At step 133, the user may press the "guide" button on the remote, which causes set-top box 81 of FIG. 6 to display program schedule grid 50 (FIG. 4) on monitor 75 (FIG. 6) at step 134. At step 25 135, the user may scroll, pan, or otherwise navigate through the displayed television program listings (e.g., using a user interface such as a remote control). At step 135, the user selects a given program to record (e.g., by positioning highlight 30 region 66 (FIG. 4) on a selected desired program). At step 137, a text or other suitable label is generated by image generation and mixing circuitry 88 for the

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selected program based on the labelling information for that program that is received from control circuitry 92. In addition, videocassette recorder 78 is activated during step 137. Videocassette recorder 78 5 may be directed to begin recording by providing control signals with control circuitry 92 to videocassette recorder 78 over control line 93 at the time when program recording is to start. Alternatively, videocassette recorder 78 may be directed to record a 10 program by programming videocassette recorder 78 to start at a given time by providing appropriate set-up commands over control line 93 in advance. In either case, program recording and momentarily program labelling are automatically activated at the 15 appropriate time without human intervention. The videocassette recorder simultaneously records both the label and the selected program during step 137. At step 138, recording ceases.

Although users are preferably able to choose 20 television programs for recording from a displayed program guide grid, other suitable techniques may be used to select what is recorded. For example, a user may enter a desired time, date, and channel with remote control 97. Control circuitry 92 may then determine 25 which labelling information is appropriate to provide to image generation and mixing circuitry 88 based on the start time chosen for recording.

The program labelling features of the present invention may be used to label television recordings 30 that are longer or shorter than a single television program. As defined herein, the term "television

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program" encompasses television program segments that are longer or shorter than a single television program.

If desired, other arrangements may be used to provide program identification data to user equipment 5 such as set-top box 81 of FIG. 6. For example, program identification data may be provided over a data network such as the Internet.

The foregoing is merely illustrative of the principles of this invention and various modifications 10 can be made by those skilled in the art without departing from the scope and spirit of the invention.

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What is Claimed is:

1. User equipment for use in labelling a television program with television program information during recording of the television program onto video tape by a video recorder, comprising:

means for receiving television program information from a distribution facility for at least the television program;

means for directing the video recorder to record the television program; and

means for momentarily superimposing a program label based on the television program information received for the television program on top of the television program as the video recorder begins recording the television program, so that both the momentarily superimposed program label and the television program are recorded together on the video tape.

2. The user equipment defined in claim 1 further comprising means for selecting the television program from an interactive program guide.

3. The user equipment defined in claim 1 wherein the video recorder comprises a videocassette recorder and the video tape comprises a videocassette.

4. The user equipment defined in claim 1 wherein the means for momentarily superimposing the program label on top of the television program comprises means for momentarily superimposing the title

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of the television program on top of the television program.

5. The user equipment defined in claim 1 wherein the means for momentarily superimposing the program label on top of the television program comprises means for momentarily superimposing the broadcast time of the television program on top of the television program.

6. The user equipment defined in claim 1 wherein the means for momentarily superimposing the program label on top of the television program comprises means for momentarily superimposing the broadcast date of the television program on top of the television program.

7. The user equipment defined in claim 1 wherein the means for momentarily superimposing the program label on top of the television program comprises means for momentarily superimposing the broadcast channel of the television program on top of the television program.

8. The user equipment defined in claim 1 wherein the means for receiving further comprises means for receiving television program information from a cable system headend.

9. The user equipment defined in claim 1 wherein the means for receiving further comprises means

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for receiving television program information from a satellite system distribution facility.

10. A method for labelling a television program with television program information during recording of the television program onto video tape by a video recorder, comprising the steps of:

receiving television program information from a distribution facility for at least the television program;

directing the video recorder to record the television program; and

momentarily superimposing a program label based on the television program information received for the television program on top of the television program as the video recorder begins recording the television program, so that both the momentarily superimposed program label and the television program are recorded together on the video tape.

11. The method defined in claim 10 further comprising the step of selecting the television program from an interactive program guide.

12. The method defined in claim 10 wherein the step of directing the video recorder to record the television program comprises the step of directing a videocassette recorder to record the television program.

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13. The method defined in claim 10 wherein the step of momentarily superimposing the program label on top of the television program further comprises the step of momentarily superimposing the title of the television program on top of the television program.

14. The method defined in claim 10 wherein the step of momentarily superimposing the program label on top of the television program further comprises the step of momentarily superimposing the broadcast time of the television program on top of the television program.

15. The method defined in claim 10 wherein the step of momentarily superimposing the program label on top of the television program further comprises the step of momentarily superimposing the broadcast date of the television program on top of the television program.

16. The method defined in claim 10 wherein the step of momentarily superimposing the program label on top of the television program further comprises the step of momentarily superimposing the broadcast channel of the television program on top of the television program.

17. The method defined in claim 10 wherein the step of receiving the television program information further comprises the step of receiving television program information from a cable system headend.

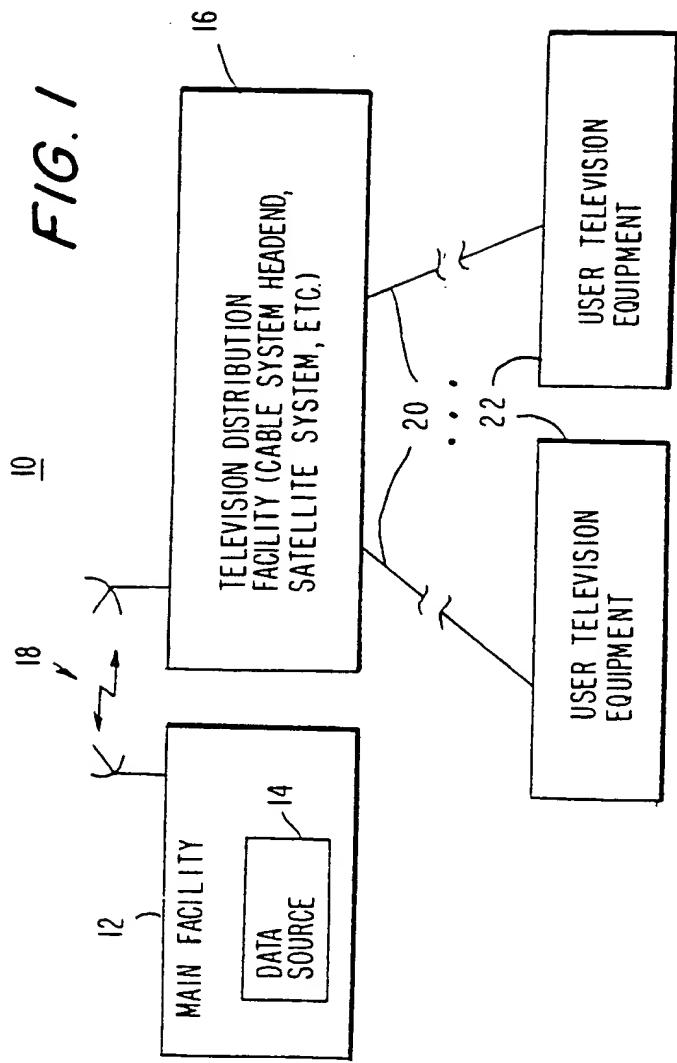
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18. The method defined in claim 10 wherein the step of receiving the television program information further comprises the step of receiving television program information from a satellite system distribution facility.

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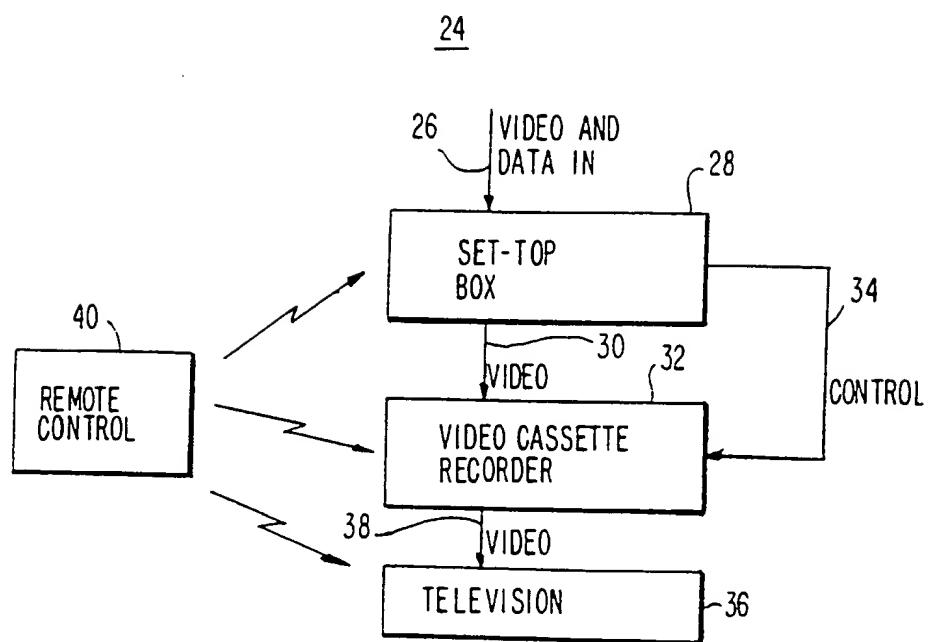
FIG. 1



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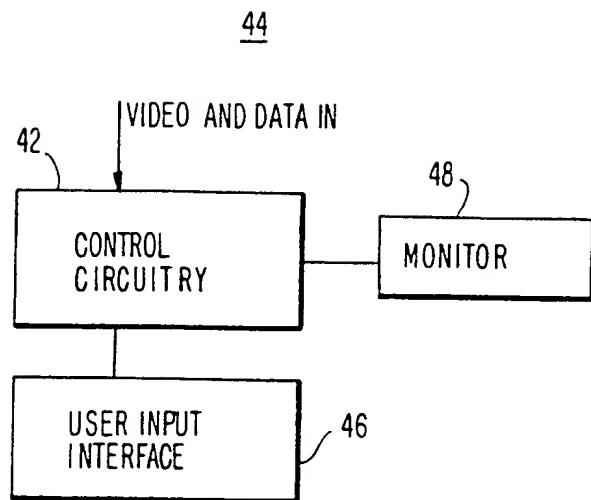
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FIG. 2



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*FIG. 3*

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FIG. 4

50

76		70		70	
77	6:35PM	6:30PM		7:00PM	
52	JULY 9, 1997	2 KJRH	PROGRAM 1		PROGRAM 2
54	3 HBO	PROGRAM 1	PROGRAM 2		72
56	4 NBC	PROGRAM 1	PROGRAM 2	PROGRAM 3	66
58	5 FOX	PROGRAM 1	PROGRAM 2	PROGRAM 3	

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68

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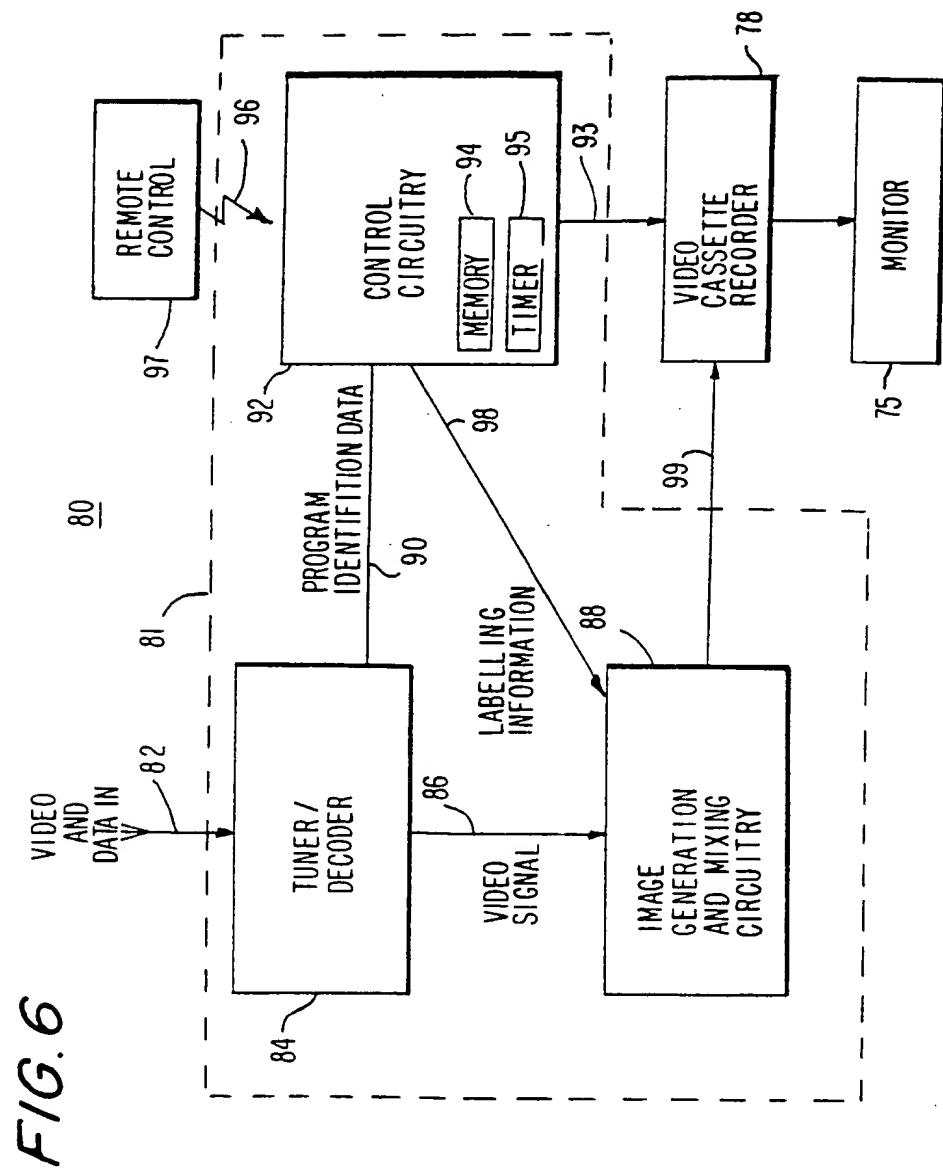
## FIG. 5

50

6:35PM		6:30PM	7:00PM	7:30PM
JULY 9, 1997				
54	→ 3 HBO	PROGRAM 1	PROGRAM 2	
56	→ 4 NBC	PROGRAM 1	PROGRAM 2	PROGRAM 3
58	→ 5 FOX	PROGRAM 1	PROGRAM 2	PROGRAM 3
55	→ 7 ABC	PROGRAM 1	PROGRAM 2	66

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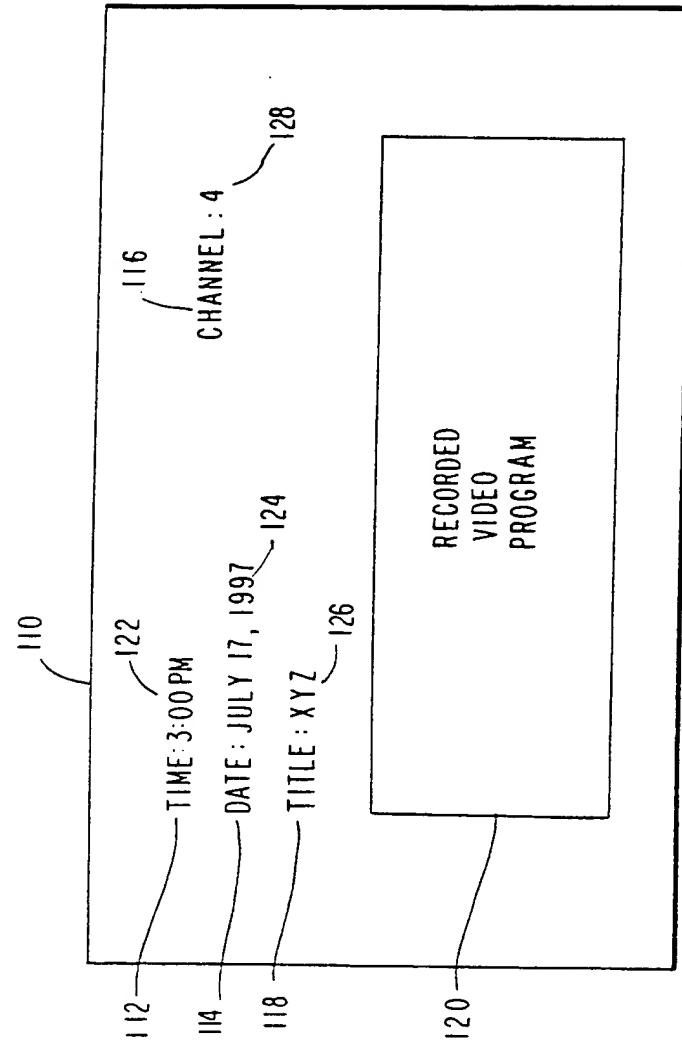
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FIG. 7



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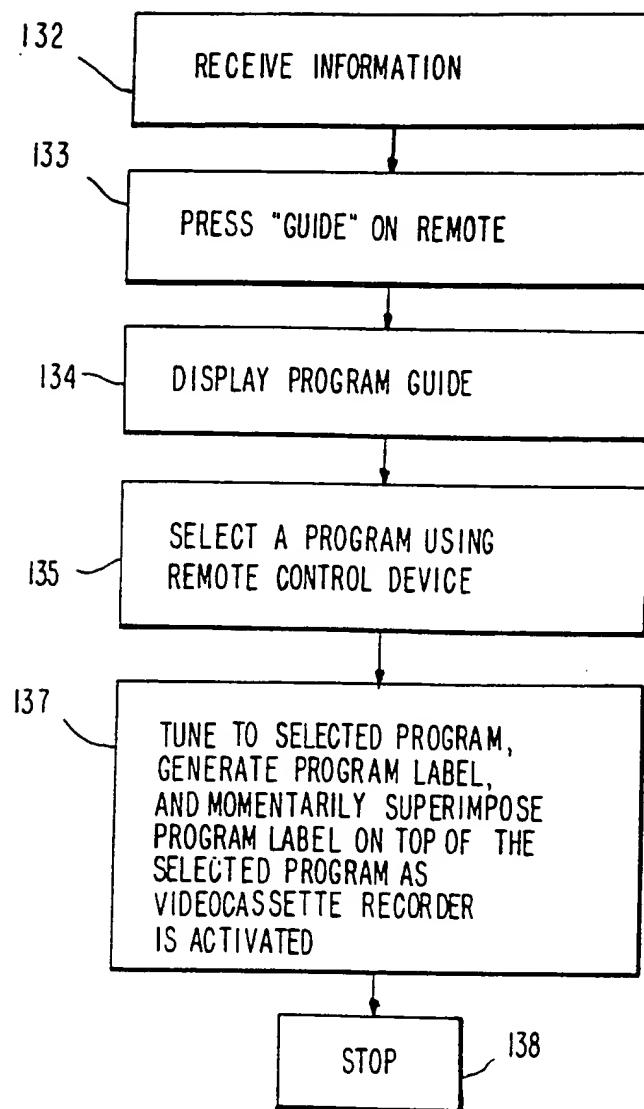


FIG. 8

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 98/17127

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 G11B27/30 H04N5/92 G11B27/34

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 G11B H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category	Citation or document with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 589 369 A (SANYO ELECTRIC CO) 30 March 1994 see column 4, line 23 - line 26 see column 6, line 37 - line 54 see column 9, line 31 - line 34 see column 10, line 24 - line 47 see column 14, line 15 - line 23	1,3-7, 10,12-16
Y	---	2,8,9, 11,17,18
Y	EP 0 773 682 A (THOMSON CONSUMER ELECTRONICS) 14 May 1997 see the whole document	2,8,9, 11,17,18
A	---	1,3-7, 10,12-16
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Further documents are listed in the continuation of box C

Patent family members are listed in annex

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Date of the actual completion of the international search

Date of mailing of the international search report

8 December 1998

15/12/1998

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## INTERNATIONAL SEARCH REPORT

Inte	rnational Application No
PCT/US 98/17127	

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
X	EP 0 322 909 A (HITACHI LTD) 5 July 1989 see column 1, line 41 - line 45 see column 2, line 8 - line 49 see column 3, line 48 - line 56 see column 7, line 46 - column 11, line 56 see column 13, line 23 - column 15, line 5 ---	1,3,4,6, 10,12, 13,15
X	DE 40 23 866 A (MITSUBISHI ELECTRIC CORP) 14 February 1991 see the whole document ---	1,3,5,6, 10,12, 14,15
A	US 5 543 929 A (MANKOVITZ ROY J ET AL) 6 August 1996 see the whole document ---	1-18
A	DE 36 21 263 A (STANDARD ELEKTRIK LORENZ AG) 7 January 1988 see the whole document ---	1-18
A	WO 95 07003 A (YUEN HENRY C) 9 March 1995 see the whole document -----	1-18

# INTERNATIONAL SEARCH REPORT

## Information on patent family members

International Application No

PCT/US 98/17127

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
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